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10/605,882	11/04/2003	Chi-Cheng Ju	MTKP0124USA	2881

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EXAMINER	
FINDLEY, CHRISTOPHER G	

ART UNIT	PAPER NUMBER
2621	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/605,882	JU, CHI-CHENG	
	Examiner	Art Unit	
	Christopher Findley	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 June 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. The Examiner notes that claims 32-34 have been added via the amendment filed on 6/20/2007.

Response to Arguments

2. Applicant's arguments filed 6/20/2007 have been fully considered but they are not persuasive.

Re claim 1, the Applicant argues that the prior art cited (Particularly Nakaya (US 7006571)) does not disclose that the GMC predicted image synthesizer and Block Matching predicted image synthesizer perform interpolation on all of the macroblocks of the video stream (Applicant's Remarks, page 9, lines 22-26). However, the Examiner respectfully disagrees. Fig. 10 of Nakaya (US 7006571) discloses that the GMC predicted image synthesizer and Block Matching predicted image synthesizer are arranged serially, in which case the operations of both units must be performed on all video data passing through (Nakaya (US 7006571): Fig. 10; column 14, lines 22-34). Therefore, the Examiner maintains the rejection of claim 1 under Nakaya (US 7006571) with respect to this limitation.

Re claim 1, the Applicant also argues that the prior art cited (Particularly Nakaya (US 7006571)) does not disclose using a single global motion vector for the whole macroblock when doing global motion compensation, but rather that the prior art synthesizes a predicted image using different motion vectors for each pixel (Applicant's Remarks, page 10, lines 20-26). However, the Examiner respectfully disagrees. While,

Nakaya (US 7006571) does disclose synthesizing a predicted image using different motion vectors for each pixel, Nakaya (US 7006571) also discloses adapting the prior art algorithm to regular global motion and calculating a global motion vector for a single representative point in a macroblock (Nakaya (US 7006571): column 11, line 55, through column 12, line 14), with the corner points used in the calculation of global motion vectors corresponding to corner points of a macroblock (Nakaya (US 7006571): Fig. 1; column 2, lines 63-67). Therefore, the Examiner maintains the rejection of claim 1 under Nakaya (US 7006571) with respect to this limitation.

Re claim 13, the Applicant argues that Nakaya (US 7006571) does not teach performing interpolation operations according to a global motion vector (Applicant's Remarks, page 11, lines 22-24) and that Nakaya does not teach the global motion vector being in a form substantially identical to that of the macroblock motion vector (Applicant's Remarks, page 12, lines 1-3). However, the Examiner respectfully disagrees. Nakaya (US 7006571) discloses performing interpolation using a representative global motion vector (Nakaya (US 7006571): column 11, line 55, through column 12, line 19), wherein the corner points used in the calculations correspond to the corner points of a macroblock (Nakaya (US 7006571): Fig. 1; column 2, lines 63-67). Therefore, the Examiner maintains the rejection of claim 13 under Nakaya (US 7006571).

Re claim 24, the Applicant argues that Nakaya (US 7006571) does not teach a global motion vector and therefore also does not teach a translation unit for translating the global motion parameters into a global motion vector (Applicant's Remarks, page

12, lines 24-26). The Applicant also argues that Nakaya does not teach the global motion vector being in a form substantially identical to that of the macroblock motion vector. However, the Examiner respectfully disagrees. Nakaya (US 7006571) discloses a global motion predicted image synthesizer (Fig. 12), wherein the motion vectors for representative points are calculated from input motion information. Further arguments for claim 24 are analogous to those presented for claim 13 above, and, therefore, the response to claim 13 is applicable to claim 24. The Examiner maintains the rejection of claim 24 under Nakaya (US 7006571).

Re claim 2, the Applicant argues that Nakaya (US 7006571) does not teach a global motion vector, and therefore also does not teach translation unit for generating the global motion vector by converting global motion parameters associated with a current frame of the video stream for use by the interpolation unit (Applicant's Remarks, page 13, lines 7-11). Arguments for claim 2 are analogous to those presented for claim 24 above, and, therefore, the response to claim 24 is applicable to claim 2. The Examiner maintains the rejection of claim 2 under Nakaya (US 7006571).

Re claim 14, the Applicant argues that Nakaya (US 7006571) does not teach a global motion vector and therefore also does not teach converting global motion parameters associated with a current frame of the incoming video stream into the global motion vector (Applicant's Remarks, page 13, lines 12-15). Arguments for claim 14 are analogous to those presented for claim 24 above, and, therefore, the response to claim 24 is applicable to claim 14. The Examiner maintains the rejection of claim 2 under Nakaya (US 7006571).

Re claim 4, the Applicant argues that Nakaya (US 7006571) does not teach a global motion vector and therefore it would not be obvious to a person skilled in the art to include a global motion vector storage unit (Applicant's Remarks, page 13, lines 22-24). However, the Examiner respectfully disagrees. Nakaya (US 7006571) does disclose a global motion vector (Nakaya (US 7006571): column 11, line 55, through column 12, line 14). Therefore, the Examiner maintains the rejection of claim 4 under Official Notice, with respect to this limitation, in that it would have been obvious to one of ordinary skill in the art at the time of the invention to include global motion vector storage in order to provide error resiliency when performing complex motion calculations.

The Applicant also argues, re claim 4, that Nakaya (US 7006571) does not teach a multiplexer for selecting whether the interpolation unit uses the macroblock motion vector or the global motion vector. However, the Examiner respectfully disagrees. Nakaya (US 7006571) discloses in Fig. 9, that a switch (Nakaya (US 7006571): Fig. 9, element 908) selects between global motion and block matching. Furthermore, this switch (Nakaya (US 7006571): Fig. 9, element 908), global motion components (Nakaya (US 7006571): Fig. 9, elements 902 and 911), and block matching component (Nakaya (US 7006571): Fig. 9, element 905), are contained within the motion compensation processor (Nakaya (US 7006571): Fig. 9, element 616), which itself is a singular component of the encoding apparatus (Nakaya (US 7006571): Fig. 6, element 616). Therefore, the Examiner maintains the rejection of claim 4 under Nakaya (US 7006571) for this limitation.

Re claim 26, the Applicant argues that Nakaya (US 7006571) neither teaches an interpolation unit nor a global motion vector (Applicant's Remarks, page 14, lines 19-20). However, the Examiner respectfully disagrees. Nakaya (US 7006571) discloses performing interpolation using a representative global motion vector (Nakaya (US 7006571): column 11, line 55, through column 12, line 19). Therefore, the Examiner maintains the rejection of claim 26 under Nakaya (US 7006571).

Re claim 11, the Examiner notes that the Applicant has amended claim 11 to change the indefinite phrase "is capable of" to "for" and has added the word "only" in front of "incoming MPEG-4 stream having a no_of_sprite_warping_point parameter set to either 0 or 1." This qualifies as a range of 0 to 1 sprite warping points, which is encompassed by the well-known range of 0 to 4 sprite warping points in MPEG-4 encoders and decoders. The Examiner notes that the courts have long established that this modification of range is well within the purview of one of ordinary skill in the art (See: In re Reven, 156 USPQ 679 (CCPA 1968)). Furthermore, the courts have established that "omission of an element and its function in a combination is an obvious expedient if the remaining elements perform the same functions as before." (See: In re Karlson, 136 USPQ 184 (CCPA 1963)) Therefore, the Examiner maintains the rejection of claim 11 under Official Notice.

Re claim 22, arguments analogous to those presented for claim 11 above are applicable to claim 22, and, therefore, the Examiner maintains the rejection of claim 22 under Official Notice.

A copy of the original office action, along with prior art rejections for the new claims 32-34 and updated rejections of claims 11 and 22 to reflect the amended limitations, has been attached below.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claim 1-3, 12-15, 23-26, 29, and 32-33 are rejected under 35 U.S.C. 102(e) as being anticipated by Nakaya (US 7006571 B1, hereafter referred to as "'6571").

Re claim 1, '6571 discloses an apparatus for performing motion compensation when decoding an incoming video bit stream including a plurality of frames having first macroblocks encoded using block-matching motion compensation (Fig. 11/1101) and second macroblocks encoded using global motion compensation (Fig. 11/911), the apparatus comprising: an interpolation unit for performing interpolation operations on each macroblock contained in each frame of the incoming video stream (column 13, lines 56-61; the images are synthesized relative to the previously decoded images); wherein when processing a current macroblock, if the current macroblock is encoded using global motion compensation, the interpolation unit performs the interpolation

operations according to a global motion vector on a per-macroblock basis (column 15, lines 2-8).

Re claim 2, '6571 discloses converting global motion information into representative vectors (Equations (5), (6), (7), and (8); the vector components are calculated from motion information parameters).

Re claim 3, '6571 discloses that when processing the current macroblock, if the current macroblock is encoded using block-matching motion compensation, the interpolation unit performs the interpolation operations according to at least one macroblock motion vector contained in the current macroblock (Fig. 11; column 15, lines 2-8).

Re claim 12, '6571 discloses that when performing the interpolation operations, the interpolation unit uses a bilinear interpolation process (column 3, lines 37-40).

Claim 13 is the corresponding method claim to the apparatus of claim 1 and has been analyzed and rejected with respect to claim 1 above.

Claim 14 has been analyzed and rejected with respect to claim 2 above.

Claim 15 has been analyzed and rejected with respect to claim 3 above.

Claim 23 has been analyzed and rejected with respect to claim 12 above.

Re claim 24, '6571 discloses a predicted image synthesizer in a video decoder for decoding a video bit stream and generating a predicted image (Fig. 7/711), the video bit stream including a plurality of frames having first macroblocks encoded using block-matching compensation (Fig. 11/1101) and second macroblocks encoded using global motion compensation (Fig. 11/911) , the video bit stream including macroblock motion

vectors indicating motion vectors of the first macroblocks (column 14, line 64, through column 15, line 2) and global motion parameters associated with the plurality of frames indicating a motion vector of each pixel in the second macroblocks (column 14, lines 58-64), the predicted image synthesizer comprising: a translation unit receiving the global motion parameters, and translating the global motion parameters into a global motion vector which is in a form substantially identical to that of the macroblock motion vector (Equations (5), (6), (7), and (8); the vector components are calculated from motion information parameters), and a interpolation unit for receiving a decoded image which is a previously decoded frame, receiving the global motion vector, performing interpolation operations, and generating the prediction image (column 13, lines 56-61).

Re claim 25, '6571 discloses a demultiplexer receiving the macroblock motion vectors and global motion parameters, and respectively outputting the macroblock motion vectors and the global motion parameters, the global motion parameters are sent to the translation unit and translated into a global motion vector which is in a form substantially identical to that of the macroblock motion vector, and the interpolation unit selectively receiving the macroblock motion vector or the global motion vector to perform the interpolation operations (column 14, line 54, through column 15, line 8).

Re claim 26, '6571 discloses that the interpolation unit receives the global motion vector when a current macroblock is encoded using global motion compensation (Equations (5), (6), (7), and (8); column 14, lines 58-64).

Re claim 29, '6571 discloses that the interpolation unit receives the macroblock motion vector when a current macroblock is encoded using block-matching motion compensation (Fig. 11; column 15, lines 2-8).

Re claim 32, Nakaya (US 7006571) discloses performing interpolation using a representative global motion vector (Nakaya (US 7006571): column 11, line 55, through column 12, line 19), wherein the corner points used in the calculations correspond to the corner points of a macroblock (Nakaya (US 7006571): Fig. 1; column 2, lines 63-67).

Claim 33 has been analyzed and rejected with respect to claim 32 above.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 4 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakaya (US 7006571 B1, hereafter referred to as "'6571").

Re claim 4, '6571 discloses a multiplexer for selecting whether the interpolation unit uses the macroblock motion vector or the global motion vector (column 15, lines 2-8); wherein when performing the interpolation operations on macroblocks encoded using block-matching motion compensation, the multiplexer outputs the macroblock motion vector to the interpolation unit, and when performing the interpolation operations on macroblocks encoded using global motion compensation, the multiplexer outputs the global motion vector to the interpolation unit (column 14, line 58, through column 15, line 2).

However, '6571 does not specifically disclose that either the block matching motion vector or the global motion vector are stored to a vector storage unit. The Examiner takes Official Notice that it is conventional to store such data into a buffer so that the vectors are retained until the processing steps relating to each block are completed. Therefore, one of ordinary skill in the art would have found it obvious to store the vectors into a buffer so that, due to the complexity of the calculations involved, the vectors could still be used for processing in the event of an error.

Re claim 34, '6571 discloses a majority of the features of claim 34, as discussed above in claim 24, but does not specifically disclose that the video decoder is for processing only an incoming MPEG-4 video stream having a no_of_sprite_warping_point parameter set to either 0 or 1. However, The Examiner takes Official Notice that when the number of sprite warping points is set to either 0 or 1, the block either doesn't change position (set to 0) or is moved with respect to only one motion vector without warping the boundaries of the block (set to 1). This qualifies as a

range of 0 to 1 sprite warping points, which is encompassed by the well-known range of 0 to 4 sprite warping points in MPEG-4 encoders and decoders. The Examiner notes that the courts have long established that this modification of range is well within the purview of one of ordinary skill in the art (See: In re Reven, 156 USPQ 679 (CCPA 1968)). Furthermore, the courts have established that "omission of an element and its function in a combination is an obvious expedient if the remaining elements perform the same functions as before." (See: In re Karlson, 136 USPQ 184 (CCPA 1963)) Therefore, the block behaves like that of an MPEG-1 or MPEG-2 block, which is well known to one of ordinary skill in the art.

6. Claims 5-8, 16-19, and 30-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakaya (US 7006571 B1, hereafter referred to as "'6571") as applied to claims 1-4, 12-15, 23-26, and 29 above, and further in view of Nakaya et al. (US 20010050957 A1, hereafter referred to as "'50957").

Re claim 5, '6571 does not specifically disclose that the interpolation operations comprise luminance and chrominance interpolation operations. However, '50957 discloses interpolation using luminance and chrominance values (paragraphs [0012]-[0013]). Since '6571 relates to decoding images by processing motion vectors and '50957 relates to preventing error accumulation in image decoding, one of ordinary skill in the art would have found it obvious to combine their teachings in order to improve the quality of the reproduced picture by eliminating error accumulation.

Re claim 6, '6571 does not specifically disclose that when performing the luminance interpolation operations on macroblocks encoded using block-matching motion compensation, the interpolation unit uses half-pel (or half-pixel) precision. However, '50957 discloses that, "the horizontal and vertical components of the motion vector for the Y block motion vector are integral multiples of ½ (paragraph [0016])." This describes half pixel precision for the luminance (Y) block. Since '6571 relates to decoding images by processing motion vectors and '50957 relates to preventing error accumulation in image decoding, one of ordinary skill in the art would have found it obvious to combine their teachings in order to improve the quality of the reproduced picture by eliminating error accumulation.

Re claim 7, '6571 does not specifically disclose that when performing the chrominance interpolation operations on macroblocks encoded using block-matching motion compensation, the interpolation unit uses half-pel (or half-pixel) precision. However, '50957 discloses that the ¼ pixel resolution chrominance blocks are rounded to ½ pixel precision (paragraph [0016]). Since '6571 relates to decoding images by processing motion vectors and '50957 relates to preventing error accumulation in image decoding, one of ordinary skill in the art would have found it obvious to combine their teachings in order to improve the quality of the reproduced picture by eliminating error accumulation.

Re claim 8, '6571 does not specifically disclose that when performing the luminance interpolation operations on macroblocks encoded using global motion compensation, the interpolation unit uses half-pel (or half-pixel) precision. However,

'50957 discloses that, "the horizontal and vertical components of the motion vector for the Y block motion vector are integral multiples of ½ (paragraph [0016])." This describes half pixel precision for the luminance (Y) block. '50957 further discloses that this technique is applicable to global motion compensation in addition to block matching (paragraph [0052]). Since '6571 relates to decoding images by processing motion vectors and '50957 relates to preventing error accumulation in image decoding, one of ordinary skill in the art would have found it obvious to combine their teachings in order to improve the quality of the reproduced picture by eliminating error accumulation.

Claim 16 has been analyzed and rejected with respect to claim 5 above.

Claim 17 has been analyzed and rejected with respect to claim 6 above.

Claim 18 has been analyzed and rejected with respect to claim 7 above.

Claim 19 has been analyzed and rejected with respect to claim 8 above.

Re claim 30, '6571 does not specifically state that the interpolation operations include a luminance interpolation operation and a chrominance interpolation operation, the interpolation unit uses a first resolution to perform the luminance interpolation operation and uses a second resolution to perform the chrominance interpolation operation. However, '50957 discloses chrominance blocks in quarter pixel precision (paragraph [0016]) and that this technique is applicable to global motion compensation in addition to block matching (paragraph [0052]), but these blocks are rounded to the same precision as the luminance block in order to lessen the computational complexity of interpolation. Since '6571 relates to decoding images by processing motion vectors and '50957 relates to preventing error accumulation in image decoding, one of ordinary

skill in the art would have found it obvious to combine their teachings in order to improve the quality of the reproduced picture by eliminating error accumulation.

Re claim 31, '6571 discloses that when performing the interpolation operations, the interpolation unit uses a bilinear interpolation process (column 3, lines 37-40).

7. Claim 9, 20, and 27-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakaya (US 7006571 B1, hereafter referred to as "'6571") and Nakaya et al. (US 20010050957 A1, hereafter referred to as "'50957") as applied to claims 1-8, 12-19, 23-26, and 29-31 above, and further in view of Srinivasan (US 20030202607 A1).

Re claim 9, '6571 does not specifically disclose that when performing the chrominance interpolation operations on macroblocks encoded using global motion compensation, the interpolation unit uses quarter-pel precision. '50957 discloses chrominance blocks in quarter pixel precision (paragraph [0016]) and that this technique is applicable to global motion compensation in addition to block matching (paragraph [0052]), but these blocks are rounded to half pixel precision in order to lessen the computational complexity of interpolation. Srinivasan, however, discloses a sub-pixel interpolation technique in motion estimation and compensation, which maintains the quarter pixel precision of the chrominance blocks (Fig. 18; paragraph [0183]). Since '6571, '50957, and Srinivasan relate to image decoding utilizing motion compensation and interpolated motion values, one of ordinary skill in the art at the time of the invention

would have found it obvious to combine their teachings in order to improve the image quality of the reproduced picture.

Claim 20 has been analyzed and rejected with respect to claim 9 above.

Re claim 27, '6571 does not specifically state that the interpolation operations include a luminance interpolation operation and a chrominance interpolation operation, the interpolation unit uses a first resolution to perform the luminance interpolation operation and uses a second resolution to perform the chrominance interpolation operation. '50957 discloses chrominance blocks in quarter pixel precision (paragraph [0016]) and that this technique is applicable to global motion compensation in addition to block matching (paragraph [0052]), but these blocks are rounded to the same precision as the luminance block in order to lessen the computational complexity of interpolation. Srinivasan, however, discloses a sub-pixel interpolation technique in motion estimation and compensation, which maintains different resolutions for the luminance and chrominance blocks (Fig. 18; paragraph [0183]). Since '6571, '50957, and Srinivasan relate to image decoding utilizing motion compensation and interpolated motion values, one of ordinary skill in the art at the time of the invention would have found it obvious to combine their teachings in order to improve the image quality of the reproduced picture.

Re claim 28, '6571 does not specifically state that the first resolution is a half-pel resolution, and the second resolution is a quarter-pel resolution. '50957 discloses chrominance blocks in quarter pixel precision (paragraph [0016]) and that this technique is applicable to global motion compensation in addition to block matching (paragraph

[0052]), but these blocks are rounded to the same precision as the luminance block in order to lessen the computational complexity of interpolation. Srinivasan, however, discloses a sub-pixel interpolation technique in motion estimation and compensation, which maintains the quarter pixel precision of the chrominance blocks (Fig. 18; paragraph [0183]). Since '6571, '50957, and Srinivasan relate to image decoding utilizing motion compensation and interpolated motion values, one of ordinary skill in the art at the time of the invention would have found it obvious to combine their teachings in order to improve the image quality of the reproduced picture.

8. Claims 10-11 and 21-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakaya (US 7006571 B1, hereafter referred to as "'6571") as applied to claims 1-4, 12-15, 23-26, and 29 above, and further in view of Hagiwara (US 20040223550 A1).

Re claim 10, '6571 discloses that the decoder device that is intended for use with encoded bitstreams adhering to the MPEG-1, MPEG-2, and H.263 standards. However, Hagiwara discloses an MPEG-4 decoder, which includes the same principle processing steps of the MPEG-2 compliant decoder of '6571. More specifically, Hagiwara includes a motion compensation block (Fig. 11/8), which inputs a motion vector and reference frame and outputs a motion compensated reference frame to be added to the current frame being processed. Since both '6571 and Hagiwara disclose MPEG compliant video decoders, one of ordinary skill in the art would have found it

obvious at the time of the invention to combine their teachings in order to construct an MPEG-4 decoder which processes video with a very high compression rate.

Re claim 11, the combined decoder device of '6571 and Hagiwara discloses a majority of the features of claim 11, as discussed above in claim 10, but does not specifically disclose that the video decoder is for processing only an incoming MPEG-4 video stream having a no_of_sprite_warping_point parameter set to either 0 or 1. However, The Examiner takes Official Notice that when the number of sprite warping points is set to either 0 or 1, the block either doesn't change position (set to 0) or is moved with respect to only one motion vector without warping the boundaries of the block (set to 1). This qualifies as a range of 0 to 1 sprite warping points, which is encompassed by the well-known range of 0 to 4 sprite warping points in MPEG-4 encoders and decoders. The Examiner notes that the courts have long established that this modification of range is well within the purview of one of ordinary skill in the art (See: In re Reven, 156 USPQ 679 (CCPA 1968)). Furthermore, the courts have established that "omission of an element and its function in a combination is an obvious expedient if the remaining elements perform the same functions as before." (See: In re Karlson, 136 USPQ 184 (CCPA 1963)) Therefore, the block behaves like that of an MPEG-1 or MPEG-2 block, which is well known to one of ordinary skill in the art.

Claim 21 has been analyzed and rejected with respect to claim 10 above.

Claim 22 has been analyzed and rejected with respect to claim 11 above.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher Findley whose telephone number is (571) 270-1199. The examiner can normally be reached on Monday-Friday 7:30am-5pm, Alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mehrdad Dastouri can be reached on (571) 272-7418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Christopher Findley/